

## 13.0 Other Retrofits to Reduce Risks of Damage and Water Intrusion

We would have liked to give a strict listing of priorities for other risks to houses, but it is not that simple because priorities really depend on the particular house and the characteristics of the hurricane that hits the house. The risks are listed below with a semblance of priority.



**Figure 13.1.** Missing siding pulled off by negative pressure or by wind that got into the house and pressurized it causing the siding to pop off. . If the wind shifted direction to blow rain into that opening, the damage to the rooms nearby could have been dramatic. Note plywood (or whatever) on the lower roof on the right.

***Gable end siding:*** The siding on the gable ends is critical to protecting your house. It makes the wall stronger and keeping water out of the attic. If it is deteriorated, water damaged, has delaminated or is not adequately fastened, then you need to consider siding retrofit measures. Figure 13.1 provides an example of inadequate attachment for which applying construction adhesive from within the attic might have prevented the damage.

If the siding comes off, there is nothing to prevent rain from blowing into the attic and damage ceilings.. Another risk is that good plywood or OSB sheathing is necessary for a sound gable end wall. If you don't know what type of sheathing you have, look behind the water barrier to see what is there. If it is not plywood or OSB your gable end, and possibly your whole house, is at risk.

In order to be structurally sound gable ends need to have plywood or OSB on them with a decorative exterior finish such as boards, vinyl siding or aluminum siding or have siding plywood sheets (4'x8' sheathing) such as T1-11. Anything less is insufficient because it does not provide enough structural strength, and is apt to be torn off by wind. Most of those materials are not strong enough to resist hurricanes and are very difficult to attach well enough to withstand wind. But plywood, OSB and particularly plywood type siding (for example T1-11) can deteriorate over the years with water and sun exposure. Signs of deterioration are delamination of the plywood, wide cracks and peeling of layers of plywood. Pine plywood siding and hardboard are particularly apt to have deteriorated.

When you are considering a gable end retrofit, it might be an ideal time to replace siding. Although nothing is cheap any more, replacing siding may not be a major cost factor. Sheet siding over a two car garage of an average older house might require only three sheets of siding. The advantage of replacing siding while retrofitting a gable end is that it gives you a great access for making the retrofit and you will have a well lit work area. If there is no plywood or something structurally similar or if the plywood has deteriorated, then you really have to consider replacing it so that there is structural sheathing in place. If the gable end has just boards, simulated boards foam or tarpaper then you definitely need to remove the siding and install wood structural panels and a decorative façade or just plywood siding such as T1-11. See **Section 14** for a more detailed discussion of gable end siding.

**Roof sheathing:** Making sure the roof sheathing stays attached to the roof structure is a very important part of reducing damage at gable ends. If you have re-roofed your house and had the roof sheathing re-nailed to the latest code requirements or following the recommendations in the retrofit guide, you have gone a long way towards reducing the likelihood that your gable end will fail. However, bracing of gable ends is also very important for larger gable ends and this guide focuses on ways to accomplish that bracing. If you have not had your roof deck re-nailed, you can reduce the risk of losing your gable simply by applying beads of AFG-01 rated structural wood adhesive along the joints between the roof sheathing and the roof framing members using directions provided in the web based retrofit guide. This will reduce the chance of the top of the gable end wall releasing from the roof sheathing.

Fastening of roof decking is vital to the building's ability to survive high winds. Most materials used on roofs are structurally adequate if they are nailed well enough and are not deteriorated by water or termites. If the house was not built to the *2002 Florida Building Code* or its successors, then it is highly unlikely the roof decking is adequately

fastened. If staples are used then there is no question, the fastening is inadequate regardless of the spacing. If you see two legs about 3/8" to 1/2" apart coming through the roof near the framing then staples were used. Staples with legs 1" apart were used to fasten roof felt or shingles. Fastening is vital to the survival of a roof. Replacing the covering is a great opportunity to nail the roof decking in accordance with today's building codes. So important is the adequacy of roof decking fastening onto existing buildings is that the *Florida Building Code* in effect in October first 2007 requires that roof decking be adequately fastened when the roof covering is replaced. If you are not ready to re-roof, there are some adhesive options you can look at. These are covered in the web based retrofit guide.

**Overhang and outlookers:** Overhangs and outlookers at gable ends are like sore thumbs sticking out to catch wind and consequentially peeling off roof sheathing. The key concern is when overhangs come off gable ends that have not been retrofitted lose their top attachment to the house. Typically overhangs are under designed for the pressures to which they are exposed. Some of them lend themselves to strengthening. The web based retrofit guide provides some directions for anchoring the outlookers. If you have them, check out those recommendations. You need to strap them down where they cross the gable end and also restrain the end that butts up against the second truss or rafter. If the overhangs on your house are 2' or longer then you should read more about them. In the Hurricane Retrofit Guide go to Structure, then Roofs.

**Gable vents:** Vents at gable ends are bound to let wind-driven rain into the attic. If you look in the attic just below a gable end vent you are apt to find water stains from rain driven into the attic from thunderstorms. Hurricanes produce much stronger winds. There is no known method of louvers or baffles that will keep enough water out of an attic during a sustained wind driven rain event to prevent substantial damage. Evidence of water penetration through gable end vents has been observed following most hurricanes. Preparing shutters and installing permanent hardware so that every gable end vent can be easily protected is an effective way to prevent water intrusion through the gable vents. The advantage of blocking them off permanently is that just before a hurricane you don't have to deal with blocking them off. It is best to block gable end vents off from the outside to minimize chances of water getting into the wall that can lead to mold or water getting inside the house. However, before you permanently block off your gable end vents, you need to make sure that sufficient attic ventilation will remain to meet building code requirements or the requirements of your roofing system.

**Water intrusion:** Any place you can see light coming into an attic is a place that water can come in as well. Soffits at gable ends where the gable end truss is below the roof sheathing 4" have been demonstrated by numerous hurricanes to allow damaging amounts of water into an attic. Even though they are under the overhang roof, strong winds can easily drive rain horizontally and even upwards to penetrate any hole in the wall. New homes built to hurricane standards rarely suffered structural damage from hurricane Charley, but many suffered substantial damage from water driven into attics. Other sections of the web based Hurricane Retrofit Guide discuss remedial measures you can and should consider.